ROCKY FLATS
ENVIRONMENTAL TECHNOLOGY SITE

RADIOLOGICAL AND NON – RADIOLOGICAL CHARACTERIZATION PACKAGE FOR BUILDING 776 / 777'S SATELLITE BUILDINGS

Responsible Organization: Environmental Compliance Effective Date: _____

Ted A. Hopkins / _____

Environmental Compliance Manager *Approval Signature*

NA

Print Name of Responsible Manager (N/A if RM is Approval Authority)

REVIEWED FOR CLASSIFICATION/ UCNI

By: _____

Date: _____

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1. EXECUTIVE SUMMARY

1.1 SCOPE

The scope of this Characterization Package for Building 776 / 777's Type 1 Satellite Buildings (Package) is to:

- Prepare a Supplemental Reconnaissance Level Characterization Report (RLCR) to the B776/B777 RLCR, dated August 1998, for the B776/777 Outbuildings B701, B702, B703, B710, B712A, B712, B713, B713A and B781 and their associated slabs/ foundations.

NOTE: Asphalt surfaces, soil and utilities not physically part of the referenced 776 structures are not within the scope of this package

1.2 APPLICABILITY

This Package is based upon findings in the 1998 Building 776 / 777 RLCR, on – going surveillance by 776 / 777's environmental compliance personnel, and the most recent site characterization documents. This Package identifies both areas where additional sampling is needed and areas where historical and process knowledge are sufficient to allow characterization.

The RFETS' D&D Characterization Protocol (D&DCP), the site-wide Reconnaissance Level Characterization Plan (RLCP), and the site-wide Pre-Demolition Survey Plan (PDSP) provide requirements and guidance to complete characterization. The 1998 RLCR provides sufficient analytical/process knowledge data to complete characterization for the following hazardous substances. No further analytical testing is warranted for the following:

1) Lead and other heavy metals in paint and/or on building surfaces (process knowledge and available analytical data meet 6 C.C.R. 1007-3 262.11 characterization requirements, and establish that these materials are not hazardous wastes);
2) PCBs in paint and ballasts and/or on building surfaces (40 CFR 761 does not require sampling for PCB paints for disposal at either RCRA Subtitle C and D landfills or TSCA disposal facilities, and concrete from these B776/777 satellite buildings which may be recycled on – site does not contain paint of any type)
3) VOAs in building media (available process knowledge meets 6 C.C.R. 1006-3 262.11 characterization requirements), except for Building 701, which functioned as a research and development facility (further discussion below);
4) RCRA components and chemicals for buildings B701, B702, B703, B710, B712A, B713A, and B781 (RCRA hazardous wastes have been removed, and no RCRA units were permitted in these buildings); and
5) Asbestos (characterization for asbestos in accordance with Regulation 8 of Colorado's Clean Air Act (CAA) standards has already been completed). The asbestos results will be incorporated into the final Reconnaissance Level Characterization Report (RLCR) supplement.

The 1998 RLCR identified several areas where additional analytical data was needed to complete the characterization and facility typing. This Package was developed to fill these data gaps. Additional surveys and sampling will be required for the following:

1. Beryllium swipes for all outbuildings. Consistent with recent discussions involving RFETS, DOE and CDPHE regarding beryllium management, swipe samples for beryllium will be taken in all buildings;.
2. Radiological surveys for all outbuildings and radiological samples of the cooling tower sediments and waters; and
3. Samples for RCRA heavy metals from wood, water and sediments from the Cooling Towers (B712, B713). The concrete basins underlying the cooling towers will be characterized based on analytical results of waters and sediments contained within the berms. The below – grade portions of these satellite buildings are not part of the scope.
4. Samples for RCRA heavy metals from concrete and cinder block from Building 701. The samples will be obtained from locations associated with (now removed) exhaust hoods and work benches.

1.3 SAMPLE PLAN SUMMARY

The contaminants of concern for Building 776 / 777's proposed Type 1 buildings and their specific survey and sampling requirements are found in Table 1 (below).

The boundaries to this study are: areas/volumes to be characterized using these surveys and samples include building roofs, walls, ceilings, and floors, as well as cooling tower baffles, support, retaining dikes, and slabs. Areas/volumes which are not part of the Satellite buildings and will not be surveyed or sampled under this package include adjacent soils, asphalt roads, sidewalks, and conjoining utilities (these media may be sampled at another time, as appropriate).

TABLE 1

Designated Survey Units and Estimated Survey Measurements for Radiological and Non-Radiological Contaminants

Non – radiological contaminants of concern			
Building Size in ft^2	Historic Use	Non-radiological Contaminants of Concern	Number of Measurements Required
B701 5,170 ft^2	Research Laboratory (conducted 'cold' lab tests)	Be[1]	Thirty Five swipe samples in areas most likely to harbor contamination
B702 870 ft^2	Pump House (for 712 cooling tower)	Be[1]	Five swipe samples in areas most likely to harbor contamination
B703 1080 ft^2	Pump House (for 713 cooling tower)	Be[1]	Five swipe samples in areas most likely to harbor contamination
B710 352 ft^2	Steam Reducing Station (reduced steam pressures)	Be[1]	Five swipe samples in areas most likely to harbor contamination

Non – radiological contaminants of concern			
Building Size in ft^2	Historic Use	Non-radiological Contaminants of Concern	Number of Measurements Required
B712A 90 ft^2	Propane Valve House (propane pressure reducing valve)	Be[1]	Five swipe samples in areas most likely to harbor contamination
B 701 5,170 ft^2	Research Laboratory (conducted 'cold' lab tests)	As, Ba, Cd, Cr, Hg, Pb, Se, Ag[3] VOAs	At least five core samples of concrete and/or cinder block in areas of known chemical handling
B712 3,552 ft^2	Cooling Tower Out-of-Service (uses potable, non – contact grade water to cool 776/777 by evaporation)	As, Be, Ba, Cd, Cr, Hg, Pb, Se, Ag[3]	One five point composite of sediments
			Five discrete samples of cooling tower woods[4]
			One grab sample from cooling tower waters
		Storm-water Parameters, Be	Parameters and sampling frequency identified by Surface Water Group to ensure NPDES compliance
B713 3072 ft^2	Cooling Tower (uses potable non – contact grade water to cool 776/777 by evaporation)	As, Ba, Cd, Cr, Hg, Pb, Se, Ag[3]	One five point composite of sediments
			Five discrete samples of cooling tower woods
			One grab sample from cooling tower waters
		Storm-water Parameters, Be	Parameters and sampling frequency identified by Surface Water Group to ensure NPDES compliance
713A 250 ft^2	Valve Pit (serviced cooling towers)	Be[1]	Five swipe samples in areas most likely to harbor contamination
781 1200 ft^2	Helium Pump House (stored gases)	Be[1]	Five swipe samples in areas most likely to harbor contamination

Radiological (U, Pu, Am) Characterization			
Survey Unit	Building	Historic Use	Estimated Number of Measurements Required
776001	701	Research Laboratory	15 interior+15 biased in laboratory area + 15 exterior 10% scan of accessible surfaces
776002	702	Pump house	15 interior+15 exterior 10% scan of accessible surfaces
	710	Steam Reducing Station	

Radiological (U, Pu, Am) Characterization			
Survey Unit	Building	Historic Use	Estimated Number of Measurements Required
	712A	Propane Valve House	
776003	712	Cooling Tower[2]	15 accessible+15 post demo 10% scan of accessible surfaces before demo
			Total U, Pu, and Am on sediments and waters
776004	713	Cooling Tower[2]	15 accessible+15 post demo 10% scan of accessible surfaces before demo
			Total U, Pu, and Am on sediments and waters
776005	703	Pump house	15 interior+15 exterior 10% scan of accessible surfaces
	713A	Valve Pit	
	781	Helium Pump House	

Table 1 Notes

1) Beryllium swipes and radiological surveys will be obtained from building roofs, interior and exterior walls, slabs / floors, berms, and at biased locations.
2) Per site protocols, field QC samples will be taken in addition to Table 1's schedule.
3) As, Ba, Cd, Cr, Hg, Pb, Se, Ag, and Be are abbreviations for the metals arsenic, barium, cadmium, chromium, mercury, lead, selenium, silver, and beryllium.
4) Given the unstable nature of the cooling towers, the potential for beryllium dust on the cooling tower woods will be assessed using beryllium data from the cooling towers' waters; the cooling tower's evaporative process is expected to concentrate beryllium, thus rendering a more sensitive indicator for the contaminant.
~~4)~~5) Radiological surveys of the cooling towers will be taken before and after demolition, as allowed by IH&S. Additional biased surveys will be performed as delineated in the waste release evaluation to be written for the release of the cooling tower rubble.

1.4 EXCEPTIONS TO THE PDSP REQUIREMENTS

Table 1 was generated using the DQO approach, as required by the PDSP. The only exception to the PDSP requirements of Section 3.1.2.4 (Surface Activity Measurements) is that random TSA measurements cannot be conducted on elevated surfaces of the two cooling towers due to the safety constraints associated with the towers. Post – Demolition Surveys will be conducted on the demolition debris as specified in Table 1.

This exception is reasonable, given that the upper levels of the cooling towers are not expected to be contaminated with hazardous substances derived from chemical storage or processing operations. Simply, the upper baffles of these towers have contacted only potable – grade cooling waters and the atmosphere. Recent chemical analysis of the cooling tower waters supports this assertion; the data indicated that drinking water standards were not exceeded for the analytes tested. Therefore, there is no threat of release of hazardous substances to the environment during demolition.

1.5 ISOLATION

Implementation of isolation control measures is required to ensure areas prepared for PDS remain below the unrestricted release criteria for radiological contamination during and after PDS. Isolation controls will be in place during the characterization since the data will be utilized to demonstrate compliance with PDSP requirements.

Mandatory isolation controls include the following as applicable:

1) Training of appropriate personnel on isolation controls
2) Posting appropriate labels at access points

Additional isolation controls could be used, as determined as appropriate by radiological engineering.

The D&D of these outbuildings may commence months and possibly years after the initial characterization/typing is complete. Prior to demolition, Environmental Compliance is tasked with evaluating the building for the time period from when the building was typed to the date of proposed demolition. The purpose of this evaluation is to ensure:

- All products/chemicals are removed from the buildings;
- No RCRA Units have been established in the building;
- All hazardous wastes are removed; and
- No spill or release of hazardous substance has occurred during this interval, or if so, that the release has been cleaned up. Note: Spill cleanups of all hazardous substances must be documented (e.g., Operating Log).

Any hazardous substance introduced into the building after typing that meets the following criteria must be reported to DOE/CDPHE:

- Can NOT be removed; or
- Has been spilled/released and can not be decontaminated; or
- Will impact the initial characterization/typing of a building.

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